

Patent No. 7,487,124  
Request for Cert. of Correction dated May 11, 2009  
Attorney Docket No. 3819-030682

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No. : 7,487,124 Application No. 10/618,238  
Inventor : Craig E. BOUTILIER Confirmation No. 4643  
Issued : February 3, 2009  
Title : Method and Apparatus For Solving Concisely  
Expressed Combinatorial Auction Problems

Examiner : Olabode Akintola  
Customer No. : 28289

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT  
FOR PTO MISTAKE (37 C.F.R. 1.322(a))

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

ATTENTION: Decision and Certificate of Correction Branch  
Patent Issue Division

Sir:

In accordance with 35 U.S.C. § 254, we attach hereto Form PTO/SB/44 and a copy of proof of PTO errors and request that a Certificate of Correction be issued in the above-identified patent. The following errors appear in the patent as printed:

Column 18, Line 44, Claim 14, "bid ≤the" should read – bids ≤the –  
(See the Amendment dated August 14, 2008, page 6, Line 1 of Claim 15. Claim 15 issued as Claim 14.)

Column 19, Line 51, Claim 16, "said dub bid" should read – said sub bid –  
(See the Amendment dated August 14, 2008, page 8, Claim 17, Line 2. Claim 17 issued as Claim 16.)

Column 20, Line 25, Claim 18, "relates (1) a sum" should read – relates a sum –  
(See the Amendment dated August 14, 2008, page 9, Claim 23. Claim 23 issued as Claim 18.)

Respectfully submitted,

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I certify that this correspondence is being electronically submitted to the United States Patent and Trademark Office on May 11, 2009.

05/11/2009  
Date

Mary Jo Sinicrope  
Signature

Mary Jo Sinicrope  
(Typed Name of Person Signing Certificate)

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

Page 1 of 1

PATENT NO. : 7,487,124  
APPLICATION NO. : 10/618,238  
ISSUE DATE : February 3, 2009  
INVENTOR : Boutillier

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 18, Line 44, Claim 14, "bid ≤the" should read – bids ≤the –

Column 19, Line 51, Claim 16, "said dub bid" should read – said sub bid –

Column 20, Line 25, Claim 18, "relates (1) a sum" should read – relates a sum –

MAILING ADDRESS OF SENDER: The Webb Law Firm  
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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-2450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select Option 2.*

**Notice of Allowance dated July 8, 2008**

Application No. 10/618,238

Paper Dated: August 14, 2008

Attorney Docket No. 3819-030682

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/618,238

Confirmation No. 4643

Applicant : CRAIG E. BOUTILIER

Filed : July 11, 2003

Title : METHOD AND APPARATUS FOR SOLVING  
CONCISELY EXPRESSED COMBINATORIAL  
AUCTION PROBLEMS

Group Art Unit : 3691

Examiner : Olabode Akintola

Customer No. : 28289

MAIL STOP ISSUE FEE

Commissioner for Patents

P. O. Box 1450

Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. §1.312

Sir:

In response to the Examiner's Amendment that accompanied the Notice of Allowability mailed on July 8, 2008, Applicant submits this Amendment Under 37 C.F.R. §1.312.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks** begin on page 11 of this paper.

I hereby certify that this correspondence is being electronically submitted to the United States Patent and Trademark Office on August 14, 2008.

08/14/2008

Date

  
Signature

Debbie LeDonne

Typed Name of Person Signing Certificate

<sup>9</sup>  
Claim ~~10~~. (Previously Presented) The method of claim 1, wherein step (c) includes defining an eighth mathematical relationship for each child sub bid that contributes value to the sub bid comprised of the logical operator XOR, wherein said relationship relates a value of the child sub bid to a product of the Boolean value of said child sub bid times a predetermined value.

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<sup>10</sup>  
Claim ~~11~~. (Previously Presented) The method of claim ~~10~~<sup>9</sup>, wherein the eighth mathematical relationship includes setting the value of the child sub bid to the product of the Boolean value of said sub bid times the predetermined value.

<sup>11</sup>  
Claim ~~12~~. (Original) The method of claim ~~10~~<sup>9</sup>, wherein the predetermined value is greater than or equal to the largest value of any of the child sub bids that contributes value to the sub bid comprised of the logical operator XOR.

<sup>12</sup>  
Claim ~~13~~. (Original) The method of claim ~~12~~<sup>11</sup>, wherein the predetermined value is the sum of all the prices included in the bid including the child sub bids.

<sup>13</sup>  
Claim ~~14~~. (Previously Presented) The method of claim 1, wherein step (c) includes, for each sub bid for k number of child sub bids, where k is less than a total number of child sub bids available, defining:

a ninth mathematical relationship that relates a total number of satisfied child sub bids bid to a sum of Boolean values related to satisfaction of each child sub bid;

a tenth mathematical relationship that relates a total number of satisfied child sub bids to a product of k times a Boolean value related to satisfaction of the sub bid; and

an eleventh mathematical relationship that relates a value of the sub bid to a sum of the values of each child sub bid that is satisfied and a price associated with the sub bid, wherein said price is included in the sum when said sub bid is satisfied, otherwise it is not included in the sum.

<sup>14</sup>  
Claim ~~15~~. (Previously Presented) The method of claim ~~14~~<sup>13</sup>, wherein the ninth mathematical relationship includes setting the total number of

satisfied child sub bids  $\leq$  the sum of Boolean values related to satisfaction of each child sub bid;

the tenth mathematical relationship includes setting the product of k times the Boolean value related to satisfaction of the sub bid  $\leq$  the total number of satisfied child sub bids; and

the eleventh mathematical relationship includes setting the value of the sub bid  $\leq$  the sum of the values of each child sub bid that is satisfied and the price associated with the sub bid times a Boolean value related to satisfaction of the sub bid.

15.  
Claim 16. (Previously Presented) The method of claim 1, wherein step (c)

includes:

for each sub bid comprised of one good and an associated price, defining:

a first mathematical relationship between a pair of Boolean variables that relate the one good being allocated to the bid that includes the sub bid to satisfaction of the sub bid, wherein the sub bid is satisfied when the one good is allocated thereto, and

a second mathematical relationship that relates a value of the sub bid to a product of the price of the sub bid times a value of a Boolean variable related to the satisfaction of the sub bid;

for each sub bid comprised of a logical operator AND logically connecting at least two child sub bids, defining:

a third mathematical relationship that relates a sum of Boolean values related to satisfaction of each child sub bid to a product of the total number of the child sub bids logically connected by the logical operator AND times a Boolean value related to the satisfaction of the sub bid comprised of the logical operator AND, wherein the sub bid comprised of the logical operator AND is satisfied when all of the child sub bids logically connected thereby are satisfied, and

a fourth mathematical relationship that relates a value of the sub bid comprised of the logical operator AND to a sum of the values of each child sub bid that is satisfied and the price associated with the sub bid comprised of

a tenth mathematical relationship that relates a total number of satisfied child sub bids to a product of  $k$  times a Boolean value related to satisfaction of the sub bid; and

an eleventh mathematical relationship that relates a value of the sub bid to a sum of the values of each child sub bid that is satisfied and a price associated with the sub bid, wherein said price is included in the sum when said sub bid is satisfied, otherwise it is not included in the sum.

16.  
Claim 17. (Original)

The method of claim 1, wherein:

for each sub bid comprised of one good and an associated price, said sub bid is satisfied when the one good is allocated to the bid including the sub bid;

for each sub bid comprised of a logical operator AND logically connecting at least two child sub bids, said sub bid is satisfied when all of the child sub bids are satisfied;

for each sub bid comprised of a logical operator OR or XOR logically connecting at least two child sub bids, said sub bid is satisfied when at least one of the child sub bids is satisfied; and

for each sub bid for  $k$  number of child sub bids, said sub bid is satisfied when  $k$  number of child sub bids are satisfied.

Claims 18 – 21. (Cancelled).

17.  
Claim 22. (Currently Amended)

A computer-readable medium having stored thereon instruction which, when executed by a processor, cause the processor to perform the steps of:

(a) receive a plurality of bids each of which includes a plurality of sub bids, wherein each sub bid is comprised of one of one good and an associated price and a logical operator logically connecting at least two child sub bids and a price associated with the logical operator;

(b) define an objective for the plurality of bids;

(c) define for each bid a plurality of mathematical relationships without logical operators, wherein said mathematical relationships collectively represent the bid; and

(d) process the received bids subject to the mathematical relationships to achieve the objective, wherein step (c) includes:

for each sub bid comprised of one good and an associated price, define:

a first mathematical relationship between a pair of Boolean variables that relate the one good being allocated to the bid that includes the sub bid to satisfaction of the sub bid, wherein the sub bid is satisfied when the one good is allocated thereto, and

a second mathematical relationship that relates a value of the sub bid to a product of the price of the sub bid times a value of a Boolean variable related to the satisfaction of the sub bid.

17  
22, wherein step (c) includes;  
18  
Claim 23. (Currently Amended) The computer-readable medium of claim

for each sub bid comprised of a logical operator AND logically connecting at least two child sub bids, define:

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a third mathematical relationship that relates (1) a sum of Boolean values related to satisfaction of each child sub bid to a product of the total number of the child sub bids logically connected by the logical operator AND times a Boolean value related to the satisfaction of the sub bid comprised of the logical operator AND, wherein the sub bid comprised of the logical operator AND is satisfied when all of the child sub bids logically connected thereby are satisfied, and

10  
a fourth mathematical relationship that relates a value of the sub bid comprised of the logical operator AND to a sum of the values of each child sub bid that is satisfied and the price associated with the sub bid comprised of the logical operator AND, wherein said price is included in the sum when said sub bid is satisfied, otherwise it is not included in the sum;

15  
for each sub bid comprised of a logical operator OR or XOR logically connecting at least two child sub bids, define:

20  
a fifth mathematical relationship that relates a sum of Boolean values related to satisfaction of each child sub bid to satisfaction of the sub bid comprised of the logical operator OR or XOR, wherein the sub bid comprised